SECTION 238239
HVAC UNIT HEATERS

PART 1 – GENERAL

101. EXTENT

101.1 This Section covers HVAC unit heater furnished and installed by the CONTRACTOR.

102. RELATED WORK SPECIFICIED IN OTHER SECTIONS

102.1 Section 230500 - General Requirements for HVAC Systems

103. DESIGN REQUIREMENTS

103.1 The design and performance of the unit heaters shall meet the requirements of Section 230500.

104. REFERENCE DOCUMENTS

104.1 Related standards, Specifications, manuals and/or other publications of nationally recognized organizations are referenced herein. Methods, Equipment and materials shall comply with applicable or specified portions of referenced documents, in addition to Federal, State or local Codes having jurisdiction.

104.2 References to these documents shall be to the issue date as adopted in IBC 2006. If the document is not referenced in IBC 2006, then the reference is to the latest issue date of the document together with the latest additions, addenda, amendments, supplements, etc. in effect on the date of contract award.

104.3 ARI - Air-Conditioning and Refrigeration Institute

104.4 ANSI - American National Standards Institute

104.5 ASHRAE - American Society of Heating, Refrigerating, and Air Conditioning Engineers

104.6 ASTM - ASTM International

104.7 NFPA - National Fire Protection Association:

a. 70 - National Electrical Code

b. 90A - Installation of Air Conditioning and Ventilating Systems

c. 90B - Installation of Warm Air Heating and Air Conditioning Systems

104.8 International Building Code

104.9 ASME - American Society of Mechanical Engineers

104.10 AWS - American Welding Society

104.11 UL - Underwriter's Laboratory

105. SUBMITTALS

105.1 Submit documents for review in accordance with Section I – Contract Drawing and Data Requirements.

105.2 Product and performance data for each heater type.

105.3 Elementary and wiring diagrams detailing power and control wiring and differentiating clearly between manufacturer-installed wiring and field-installed wiring.

105.4 Field test reports from a qualified independent inspecting and testing agency indicating and interpreting test results relative to compliance with performance requirements of unit heaters.

106. GENERAL QUALITY CONTROL AND QUALITY ASSURANCE PROVISIONS

106.1 Work shall be performed at the temperatures recommended by the product manufacturer.

107. DELIVERY, HANDLING AND STORAGE

107.1 Material shall be delivered in unbroken, factory furnished packaging and stored in a clean, dry indoor space that provides protection against the weather.

108. MAINTENANCE

108.1 Stored items shall be protected from the weather, humidity and temperature variations, dirt and dust, or other contaminants. Proper protection and care of all material both before and during installation shall be the CONTRACTOR's responsibility. Replace any materials found to be damaged at the CONTRACTOR's expense.

108.2 During installation, piping and similar openings shall be capped to keep out dirt and other foreign matter.

PART 2 – PRODUCTS

201. ELECTRIC UNIT HEATERS – HEAVY DUTY TYPE

201.1 Acceptable Manufacturers:

a. Brasch Manufacturing Co., Inc.

b. Chromalox

c. Indeeco

d. Markel Products Company.

e. Trane Co.

f. Ruffneck

201.2 Components:

a. The heater(s) shall be of the heavy duty, forced air type.

b. The heater(s) shall be CSA C/US certified to CSA Standard C22.2 No. 46-M1988 Electric Air Heaters, and UL Standard 1025 Electric Air Heaters.

c. Heaters shall use finned tubular elements to transfer the heat. Elements shall have epoxy sealed terminals to eliminate the possibility of contamination from moisture and airborne impurities.

d. A factory balanced aluminum fan blade shall provide the airflow through the heater.

e. Fan guards shall be provided with each unit and OSHA approved.

f. The heater shall have individually adjustable louvers to direct the outlet airflow.

g. Motors shall be of the totally enclosed type with permanently lubricated ball bearings and built-in thermal overload, with the voltage rating the same as the heater. The motor shall be mounted outside of the element bundle to provide access for maintenance.

h. The heater shall be supplied with built-in overheat protection of the auto-reset, bimetal type.

i. The unit heaters shall incorporate a fan delay in the "On" and "Off" cycles. "Fan-only" terminals for connection to a remote switch shall also be supplied as standard.

202. ELECTRIC UNIT HEATERS – WASHDOWN CORROSION RESISTANT

202.1 Acceptable Manufacturers:

a. Brasch Manufacturing Co., Inc.

b. Chromalox

c. Indeeco

d. Markel Products Company.

e. Ruffneck

202.2 Components:

a. The electric unit heater shall be rated for washdown applications and shall include built-in controls.

b. Heaters shall be UL Listed assemblies containing all limits and controls as required by UL specifications.

c. Controls shall be housed in a NEMA 4X stainless steel 316 control enclosure fixed to bottom of unit heater.

d. The control enclosure shall open from bottom for ease of installation and service. The control enclosure shall include contactors, transformer, fusing (NEC required) pilot light (power on), thermostat and 3-position switch (heat – off – fan).

e. The heater scroll shall be 304 stainless steel with 304 stainless steel outlet louver.

f. The motor shall be totally enclosed, permanently lubricated, designed to resist moisture and corrosion, and factory-wired to NEMA 4X enclosure.

g. Door interlock disconnect on NEMA 4X control enclosure shall be factory installed and wired.

h. Heavy-duty heating elements factory wired and sealed for washdown application shall be plated for corrosion resistance.

i. Fan guards shall be provided with each unit and OSHA approved.

203. ELECTRIC UNIT HEATERS – EXPLOSION PROOF

203.1 Acceptable Manufacturers:

a. Brasch

b. Chromalox

c. Indeeco

d. Markel Products Company.

e. Ruffneck

203.2 Components:

a. Heaters shall be UL listed for Class I, Group C & D, Divisions 1 & 2 and Class II, Groups E, F and G, Divisions 1 & 2,UL temperature code shall be T3B (329°F) for Class 1 and Class II, indicating maximum operating surface temperatures.

b. Heat exchangers shall be heavy walled, liquid filled, with low watt density, immersion type copper sheathed elements hermetically sealed into the core along with the high limit thermal cut-out. Heat transfer fluid shall be ethylene-glycol solution, protected to -49°F.

c. Motors shall be explosion-proof, permanently lubricated, ball bearing type.

d. Contactors shall be built-in and pre-wired into an explosion-proof enclosure. Contactors shall be heavy duty and break all ungrounded conductors. Control transformers shall be built-in and pre-wired.

e. Fan guards shall be provided with each unit and OSHA approved.

PART 3 – EXECUTION

301. GENERAL

301.1 Unit heaters shall be installed in accordance with the manufacturer's instructions and shall be located to permit access to the coil after installation.

302. PREPARATION

302.1 Examine areas to receive unit heaters for compliance with requirements for installation tolerances and other conditions affecting performance. Do not proceed with installation until unsatisfactory conditions have been corrected.

303. ERECTION, INSTALLATION OR APPLICATION INCLUDING TRAINING

303.1 Installation shall be as shown and according to the manufacturer's diagrams, recommendations and manufacturer's installation instructions.

303.2 Install units as indicated, level and plumb, and according to Manufacturer's written instructions, the design drawings, and referenced standards

303.3 Install connections, maintaining Manufacturer's recommended clearances for service and maintenance.

304. FIELD QUALITY CONTROL

304.1 Perform initial testing of the units in accordance with manufacturer's instructions.

305. ADJUSTING AND CLEANING

305.1 Provide a temporary bypass for water coils to prevent flushing water from passing through coils.

305.2 After completing system installation, clean coils using materials and methods recommended by manufacturer. Clean inside of casings and enclosures to remove dust and debris. Maintain system in this clean condition until final acceptance.

306. PROTECTION

306.1 Handle, store, and protect equipment and materials to prevent damage before and during installation in accordance with the manufacturer's recommendations.

307. RECORD DOCUMENTATION

307.1 Installation drawings shall be submitted. Drawings shall indicate overall physical features, dimensions, ratings, service requirements, equipment weights and layout and arrangement details of equipment room.

END OF SECTION 238239